



# The Confluence Project

*Searching for solutions to...*

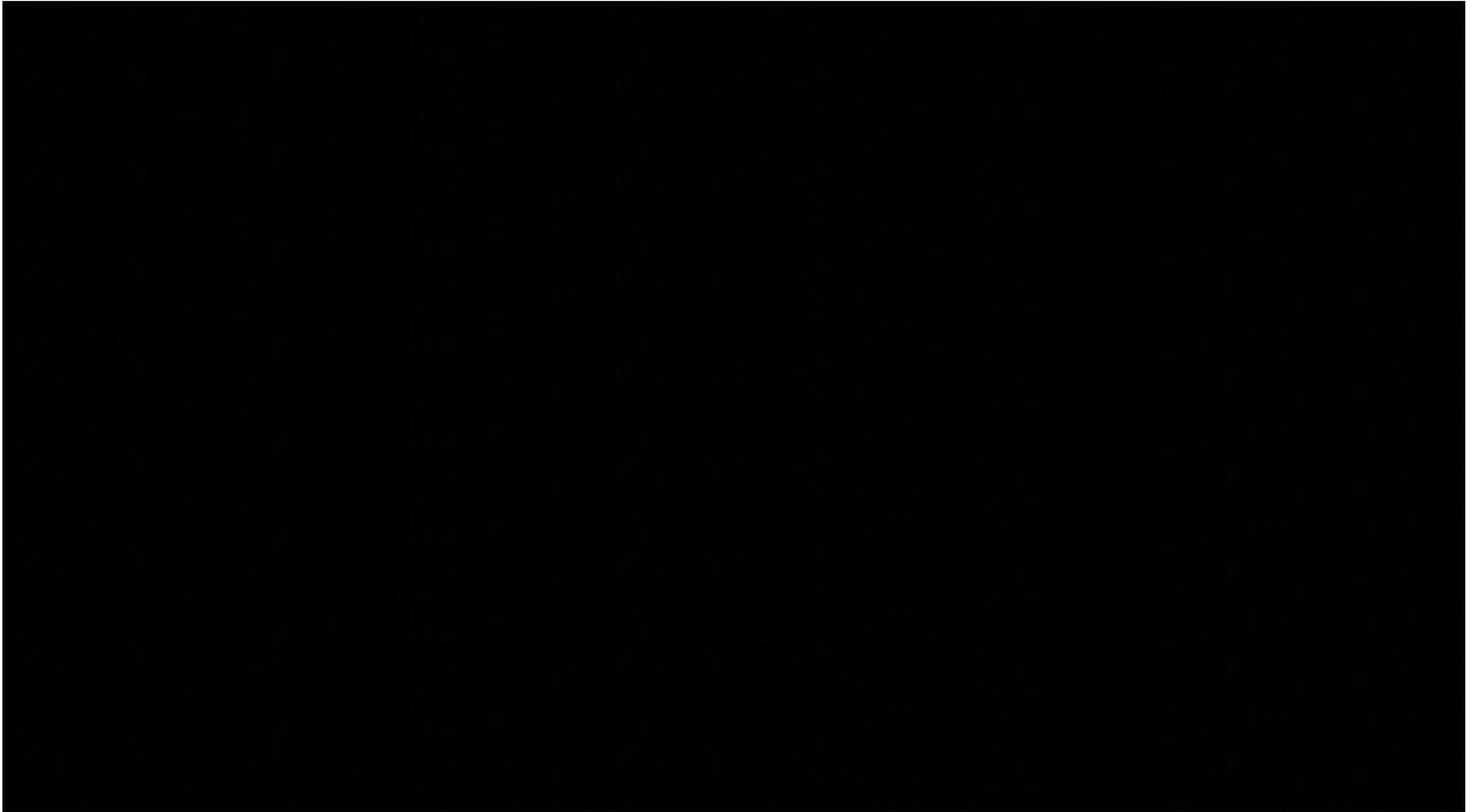
Rusti Kreider, Cindy Rust, Audrey Squires



Funding from NSF GK-12 Grant DGE-0841199;  
Idaho State Dept. of Education Science Education Grant; Avista Foundation Grant

**...solutions to:**

# The Confluence Project



# 1. Improving science education in Idaho

# How do you and your community impact your local watershed and surrounding ecosystems?



## 3 Units

Water Quality, Snow Science, Agriculture



**Q1 – WATER  
QUALITY UNIT**

**Q2 – AGRICULTURE  
UNIT**

September

**S1 – Guided  
Research Project**



**COMMON CORE**  
STATE STANDARDS INITIATIVE  
PREPARING AMERICA'S STUDENTS FOR COLLEGE & CAREER



**S2 – Independent  
Research Project**



**NEXT GENERATION  
SCIENCE  
STANDARDS**

January

February

March

April

**Q3 – SNOW SCIENCE UNIT**

**Youth  
Water  
Summit**

## 2. Fostering student connection to local watershed and environment

# Asking a Research Question

## 1. Produce Your Questions

- Ask as many questions as you can.
- Do not stop to discuss, judge or answer the questions.
- Write down every question exactly as it is stated.
- Change any statement into a question.

# Asking a Research Question

## 2. Improve Your Questions

- Categorize the questions as closed- or open-ended.
- Change closed-ended questions into open-ended questions.

# Asking a Research Question

## 3. Prioritize the Questions

- Choose your three most important questions.
- Why did you choose these three as the most important?

# Asking a Research Question

## 4. Next Steps

- How are you going to use your questions?

# Asking a Research Question

*Reflection*

Post Falls Trojans  
Lake City Timberwolves

St. Maries Lumberjacks

Potlatch Loggers

Paradise Creek Regional

Troy Trojans

Kendrick Tigers

Lewiston Bengals

# The Confluence Project Schools 2014-15

© 2015 Google  
Image Landsat

Google earth

Imagery Date: 4/9/2013 47°03'48.44" N 116°22'43.77" W elev 3092 ft eye alt 106.11 mi

# Water Quality



# Snow Science



# Agriculture



### 3. Improving local watershed health

# How?

Service learning activities

Community partnerships

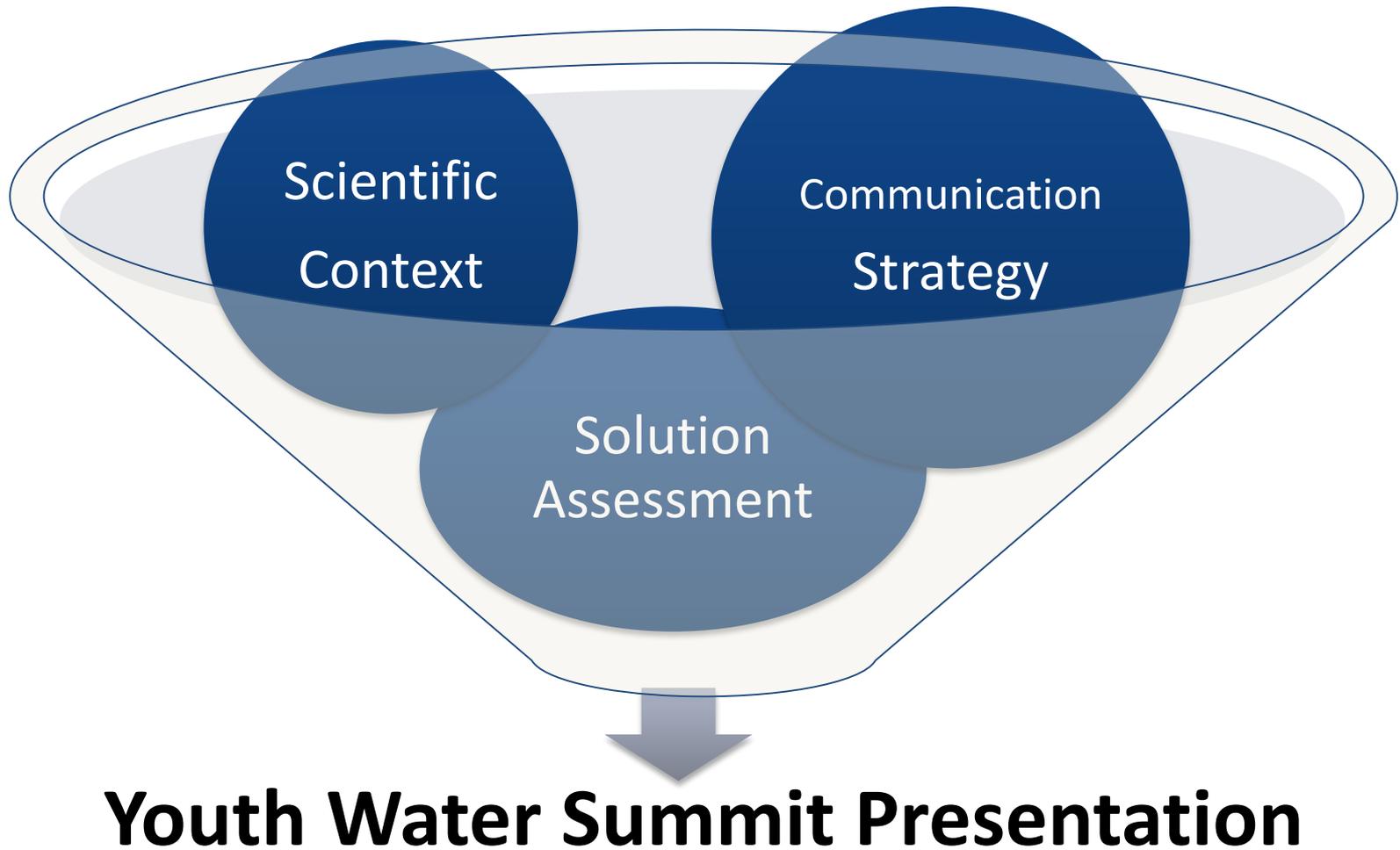
Student-driven solutions

# Reflect on Blog

“In school we are able to look at data and apply that data to our studies to help us learn, but on the trip we were able to collect the data for ourselves and test it hands on. By doing this we can understand the concepts we are learning from the data better because we were able to see how it works... Being on the trip kept me more engaged and more interested on how the systems work. This is different from a normal class because I usually do the work to get a grade and am not typically interested, and being there in action I was able to connect our learnings with real life problems.”

<http://wowconfluenceproject.wordpress.com/>

# Research Projects → *Local Watershed Issue*



**Nuclear Waste**

**Logging**

**Invasive Species**

**Rain Barrels**

**Water Quality**

**Fish**

**Residential  
Irrigation**

**Agriculture &  
Ranching**

**Climate Change  
Adaptation**

**Hydropower**

# 2015 YOUTH WATER SUMMIT

**Xeriscaping**

**Economic  
Impacts**

**Riparian  
Vegetation**

**Stakeholder  
Education**

**Recreation**

**Snowboarding**

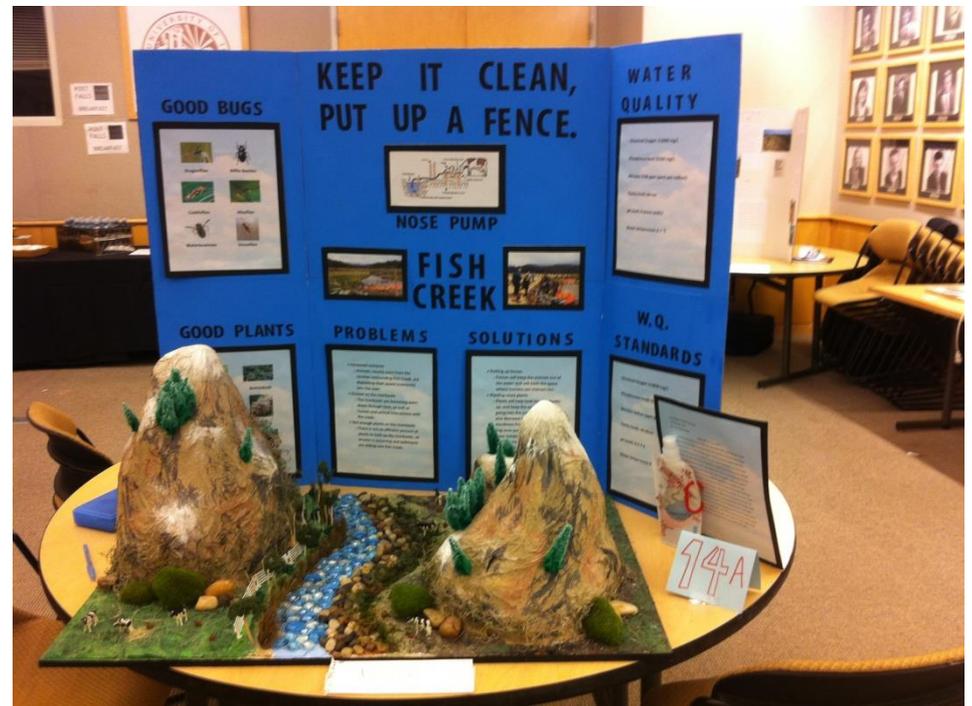
**THE CONFLUENCE PROJECT**

**Media &  
Precipitation**

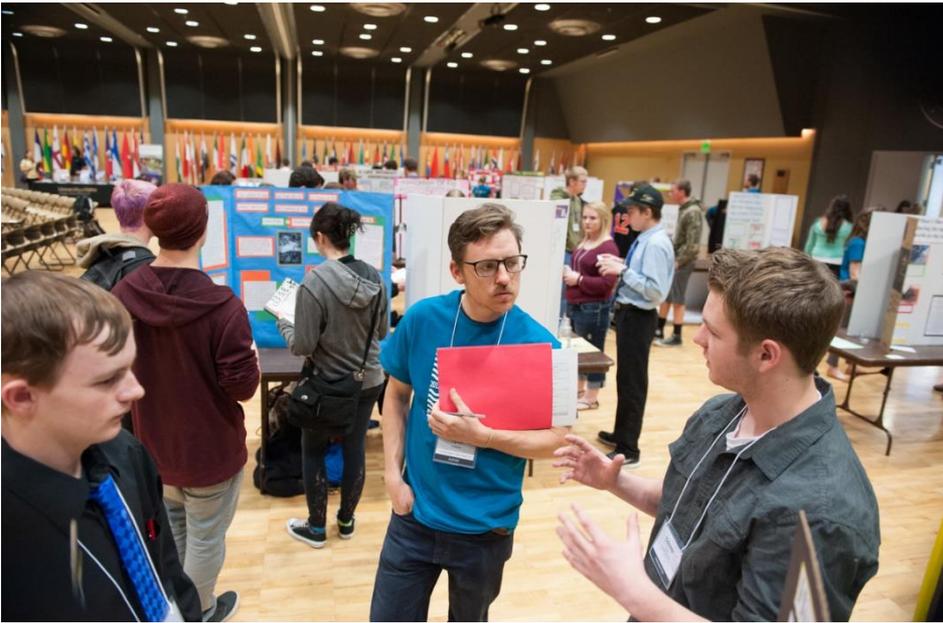
**Snowpack**

**Heavy Metals**

**Stormwater**











# What impact does TCP have?

## Research questions:

1. How does a place- and project-based, experiential watershed science curriculum impact student concern of local environmental issues?
2. How does it impact their view of the efficacy of science as a tool to solve those issues?
3. How has student view *nature of science* changed after participating in this program?

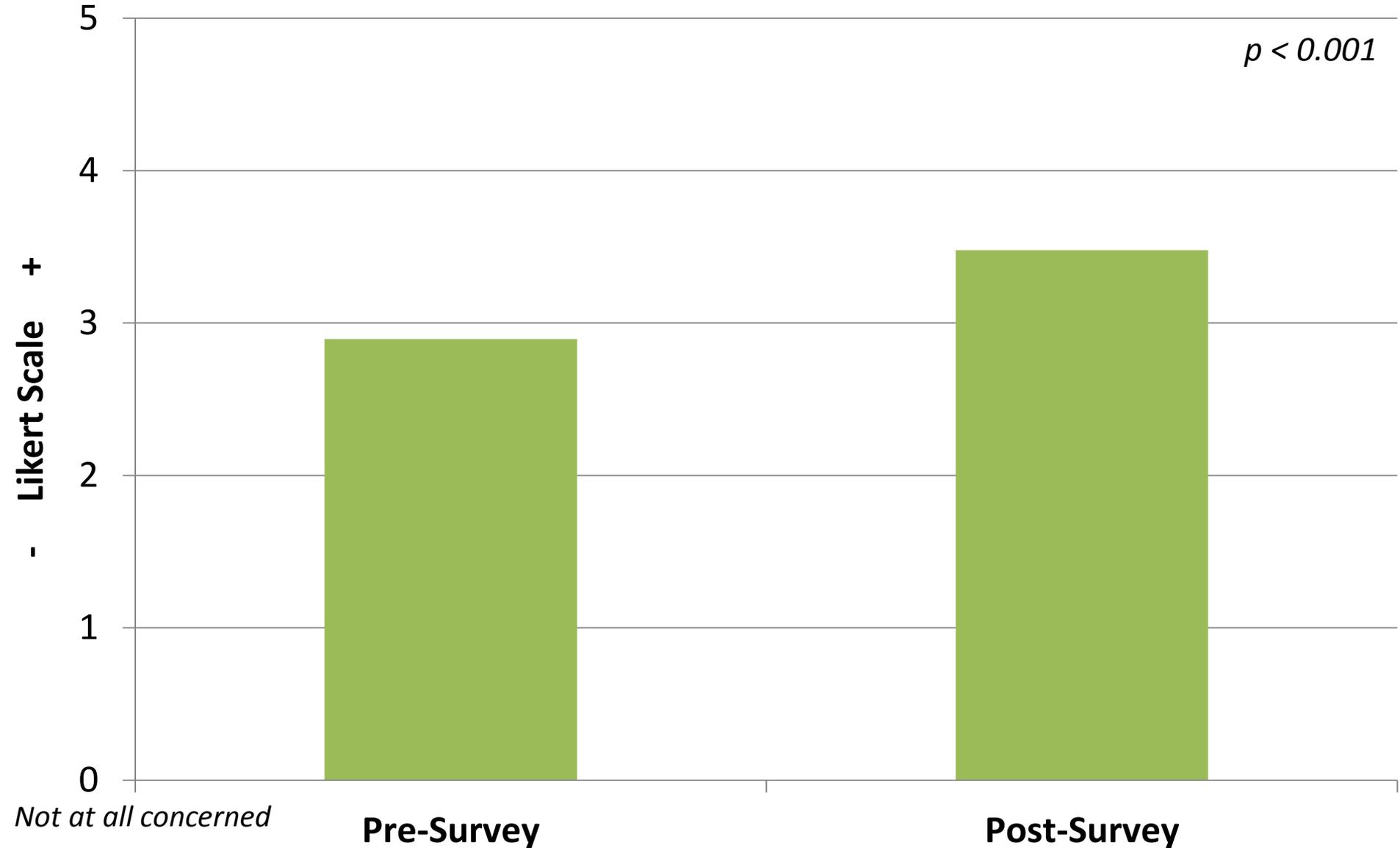
# Student Attitude Surveys

## Methods:

- Administered anonymous pre- and post-program surveys
- 5 point Likert scale (24 questions)
- Short answer questions (3 questions)
- 8 schools
- $n = 229$  and  $207$  for pre and post, respectively
- Two sample t-test/paired t-test
- Currently coding qualitative questions

# Are you concerned about ecological problems in your community?

*Very concerned*



*$p < 0.001$*

+  
- Likert Scale

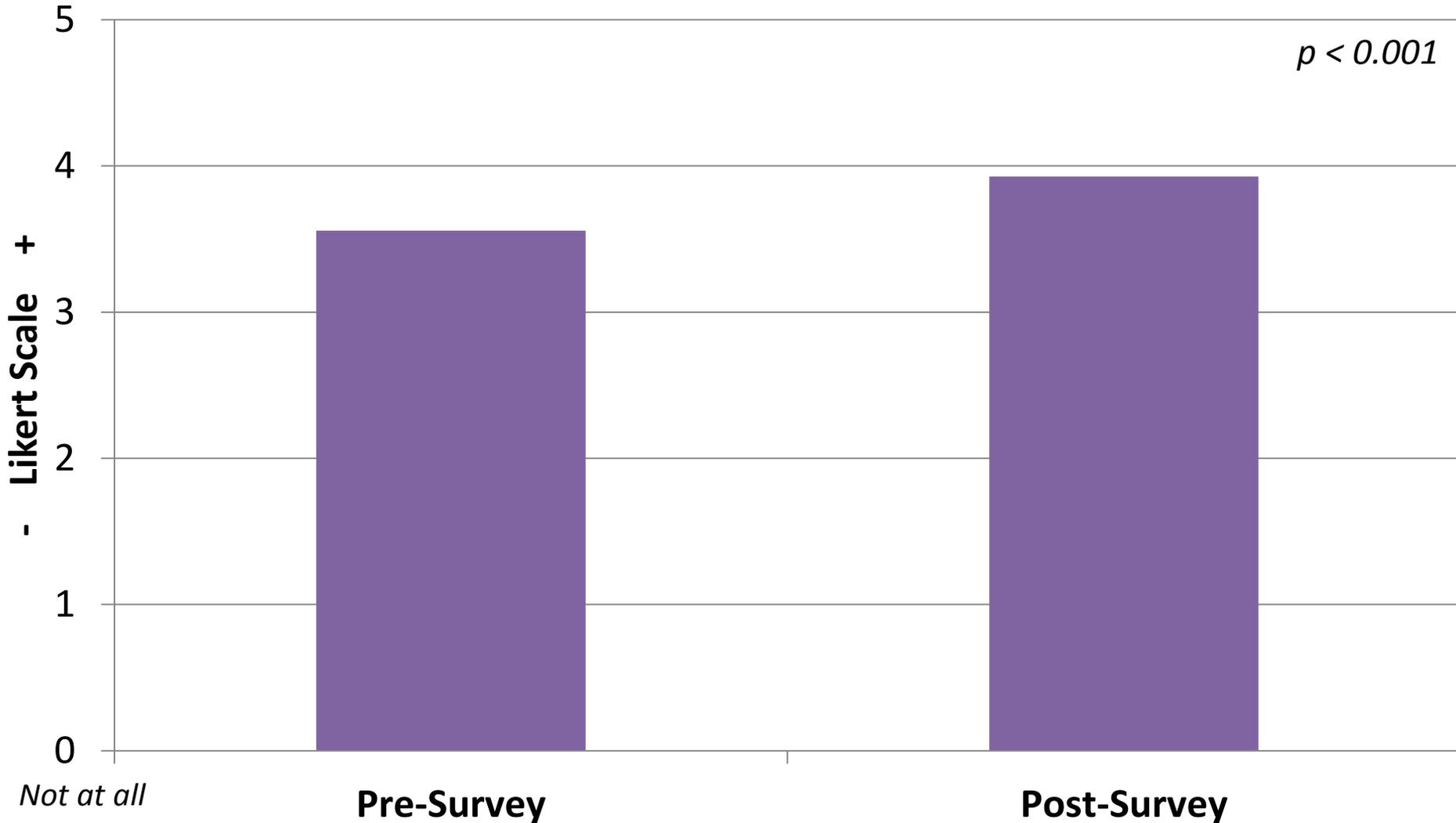
*Not at all concerned*

**Pre-Survey**

**Post-Survey**

# To what extent can scientific solutions reduce the impact of environmental issues in your community?

*Very much*



*$p < 0.001$*

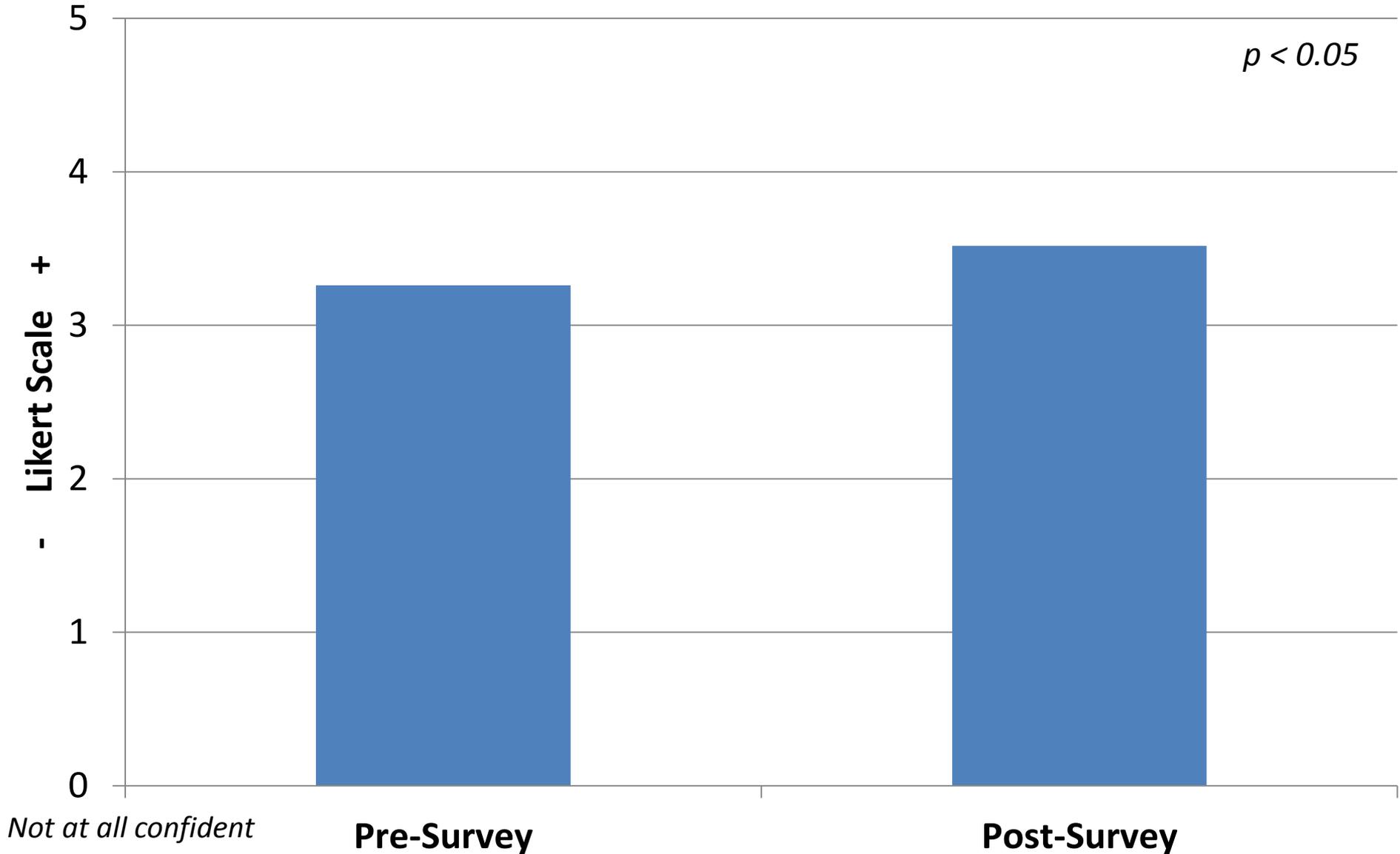
*Not at all*

**Pre-Survey**

**Post-Survey**

# How confident are you with presenting your research?

*Very confident*



$p < 0.05$

+

-

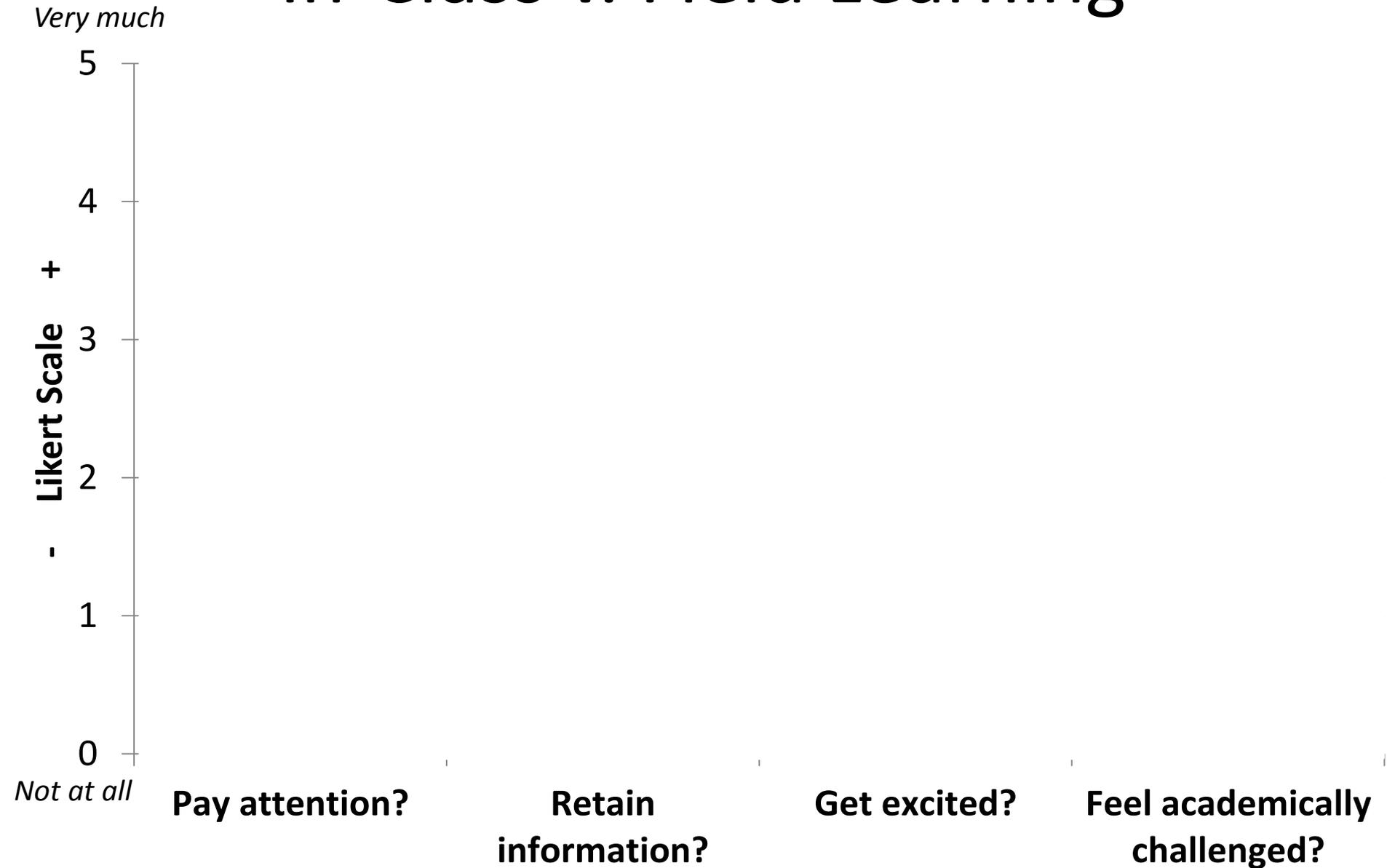
Likert Scale

**Pre-Survey**

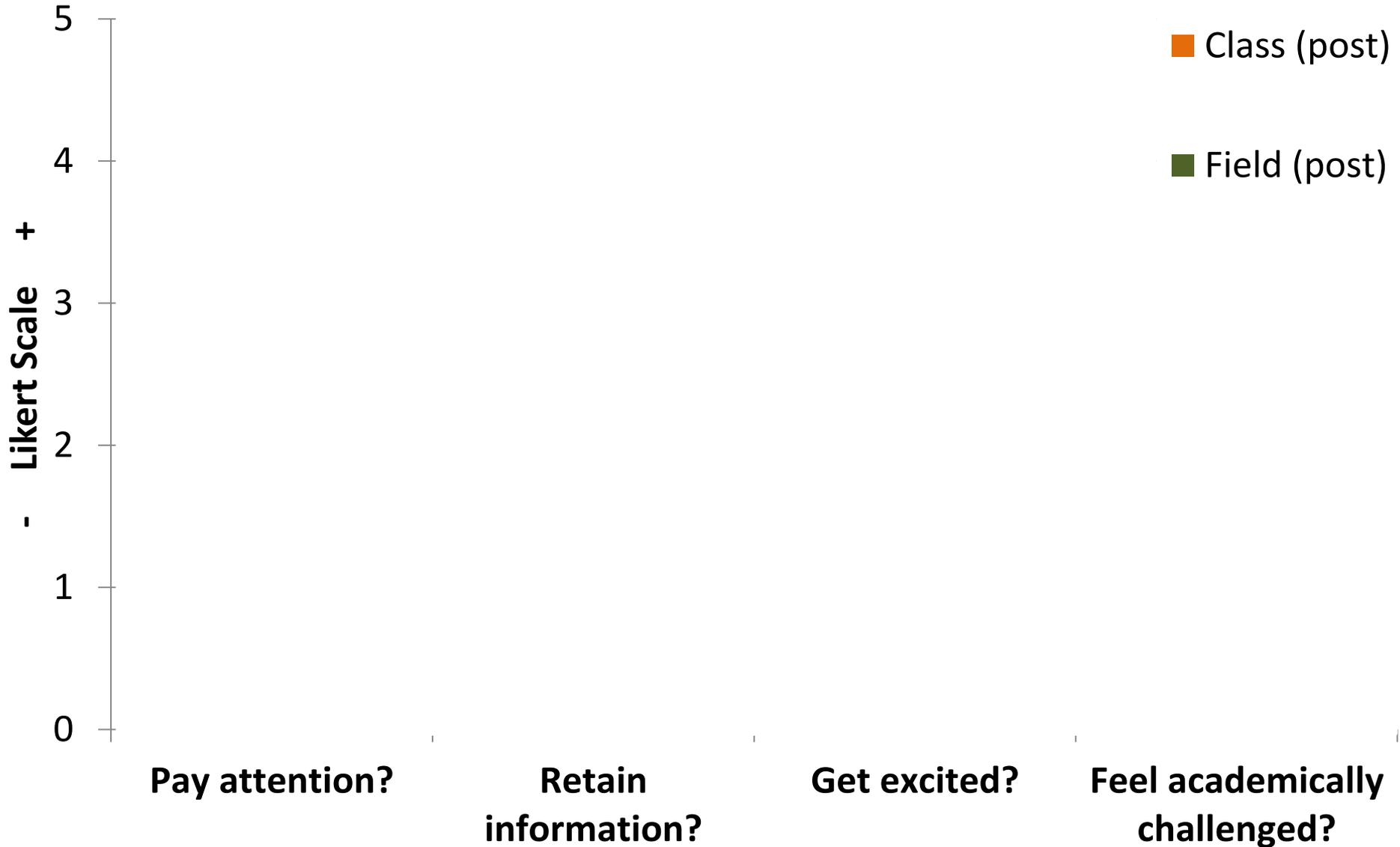
**Post-Survey**

*Not at all confident*

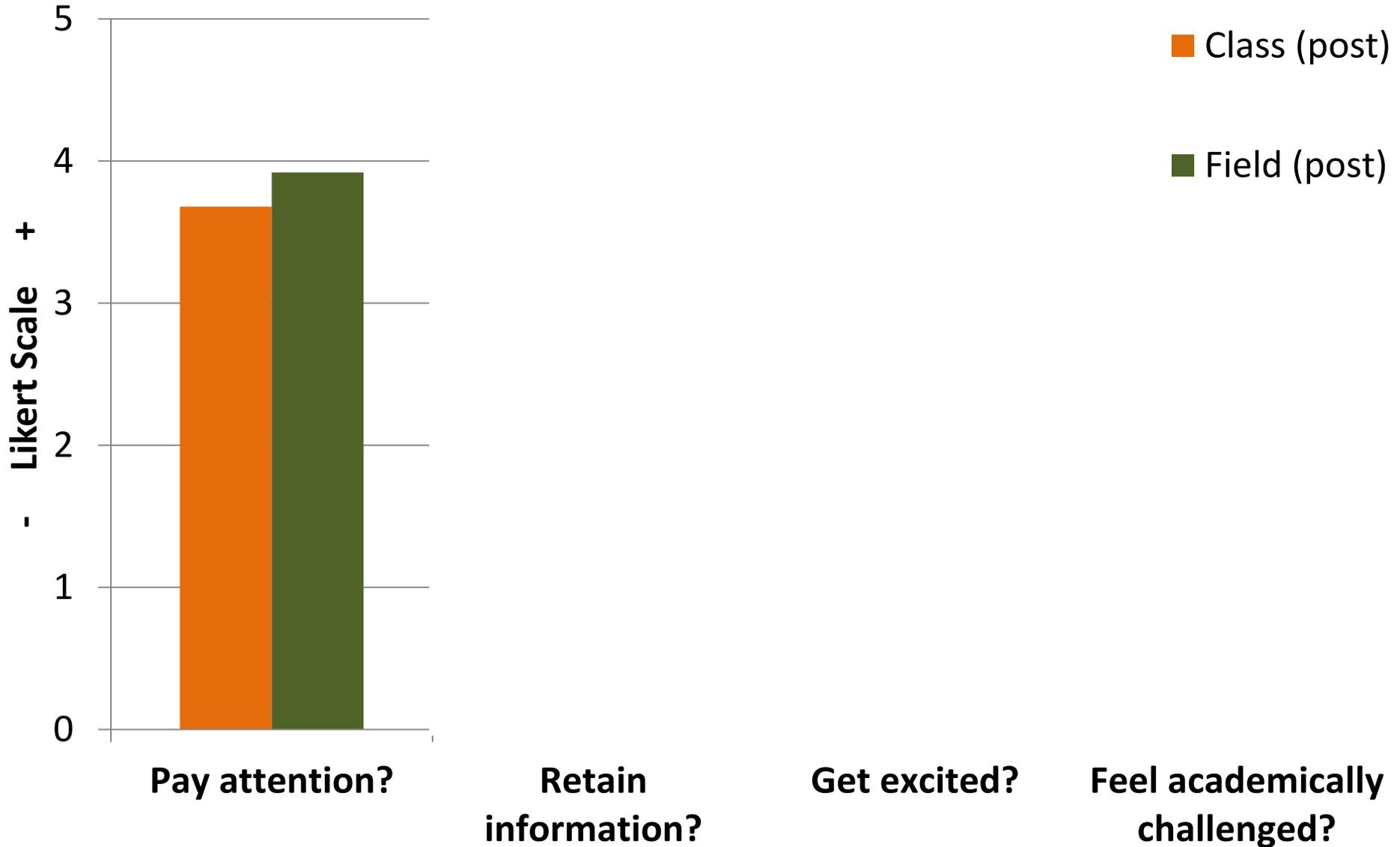
# In-Class v. Field Learning



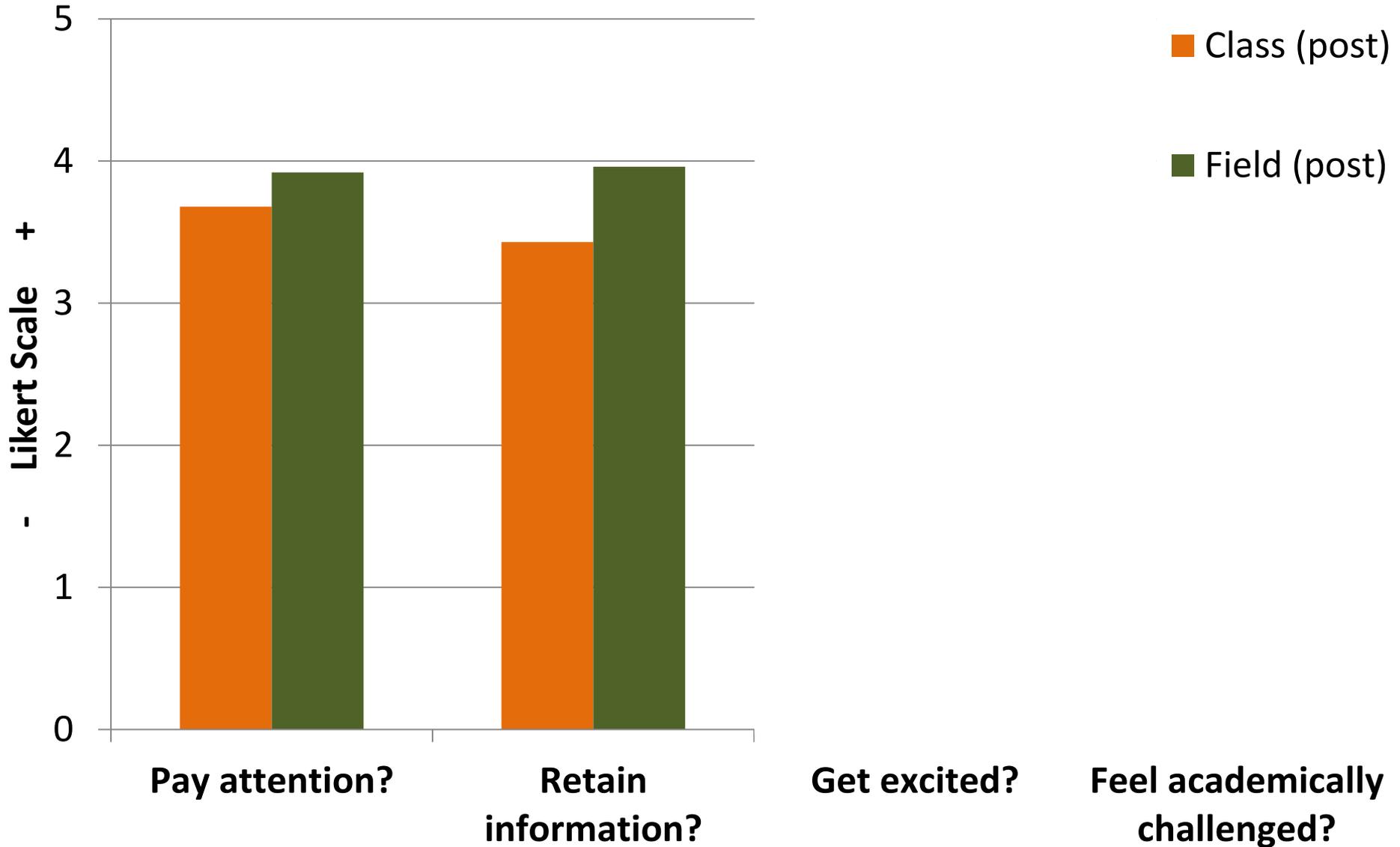
# In-Class v. Field Learning



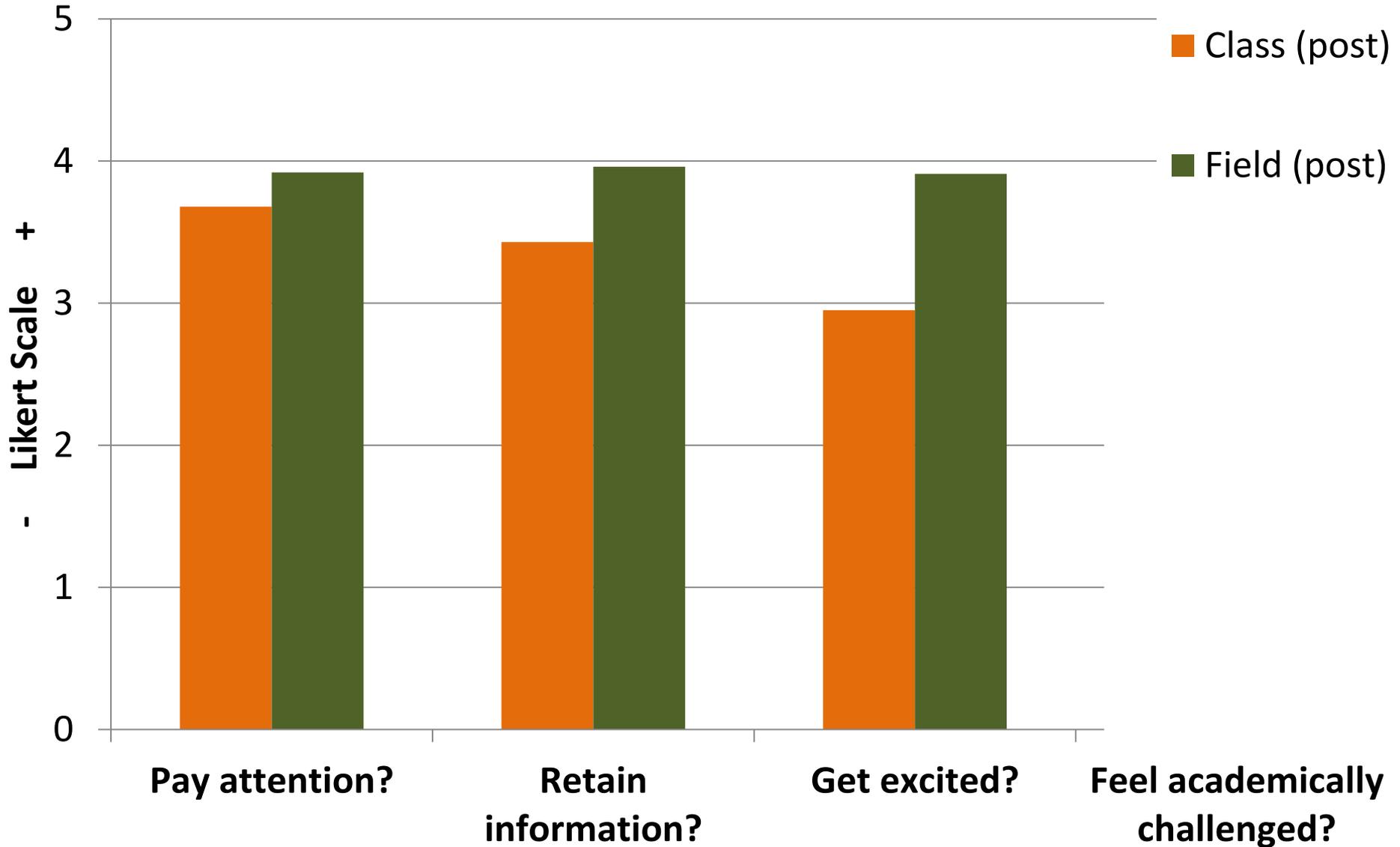
# In-Class v. Field Learning



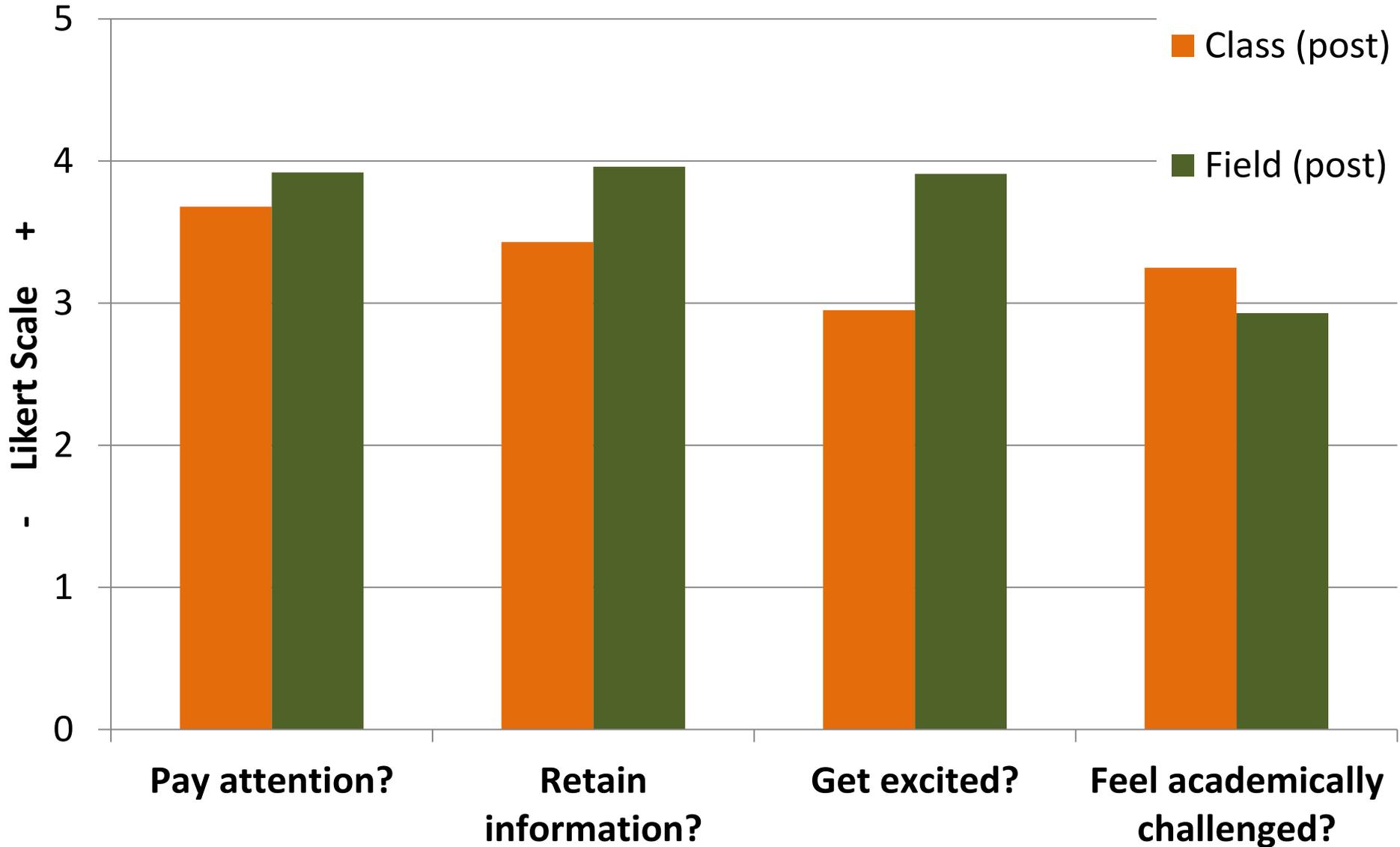
# In-Class v. Field Learning



# In-Class v. Field Learning



# In-Class v. Field Learning



Describe a time that you felt really engaged in a science class.

*“The Confluence Project was very engaging because it included a diverse group of people, took a lot of thinking skills and collaboration, and relates it to the community we live within.”*

Describe a time that you felt really engaged in a science class.

*“I felt really engaged during our snow science field trip as well as during the planting at Blackwell island because you could immediately see your results and know that you were doing something beneficial for your community and the people in it that rely on it.”*

# Impact on Students

1. Concern of local environmental issues
2. Efficacy of science as a tool to solve those issues
3. *View nature of science* changed after participating in this program

## **4. Student skills**

# Acknowledgments

- Kat Hall, Lands Council
- Jan Boll, Waters of the West
- Jim Ekins and Marie Pengilly, IDAH<sub>2</sub>O
- Brant Miller, UI College of Education
- Teachers: Jamie Esler, Matt Pollard, Deanna Kinziger, Eric McDowell, Matt Bruns, Laura Wommack

## Field Trip Collaborators

- Bureau of Land Management
- City of Coeur d'Alene WWTP
- Coeur d'Alene Tribe Lake Management Department
- Gathering Garden, NIC
- Idaho Dept. of Fish & Game
- Idaho Dept. of Environmental Quality
- Idaho Panhandle National Avalanche Center
- Kootenai Environmental Alliance
- McGlade's Orchard
- Palouse Clearwater Environmental Agency
- Strawberry Hill Nutrition Farm
- Twin Creeks Farm
- Twin Lakes Improvement Association
- Young Living Lavender Farm



Funding from NSF GK-12 Grant DGE-0841199; NSF Idaho EPSCoR; Idaho State Dept. of Education Science Education Grant; Avista Foundation Grant